APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,143	07/19/2001	Pete Castagna	060783/P008US/10102416	7067

29053 7590 06/15/2004		EXAMINER

DALLAS OFFICE OF FULBRIGHT & JAWORSKI L.L.P.
2200 ROSS AVENUE
SUITE 2800
DALLAS, TX 75201-2784

CHASE, SHELLY A

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/909,143 ⬤	Applicant(s) CASTAGNA ET AL.	
	Examiner Shelly A Chase	Art Unit 2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2001*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is

   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-36* is/are allowed.

6)☒ Claim(s) *1,8-12 and 37* is/are rejected.

7)☒ Claim(s) *2-7,13-20 and 38-50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1 to 50 are presented for examination.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims **1,** and **8** to **12** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Cooper et al. (US 2004/0015765 A1) in view of Cho et al. (*An adaptive FEC with*

QoS provisioning for real-time traffic in LEO, IEEE).

Claim **1**:

Cooper substantially teaches the claimed invention. Cooper teaches an

adaptive forward error correction method comprising: computing a bit error rate (BER)

that includes measuring uncorrectable errors for a sample window and comparing the

computed BER to a target BER (see par. 0042 and 0046 et seq.); interpreted as

"comparing a count of received data codewords and packet with errors uncorrectable by

forward error correction to at least one predetermined threshold of quality." Cooper

further teaches that if the computed BER is greater or less than the target BER an

adjustment is made to the forward error correcting power (see par. 0047 et seq.), and

the forward error correcting power is the number of data errors that can be corrected (see par. 0008). Cooper further teaches that a bit stream is divided into frames and each frame is referred to as code words (see par. 0029).

Cooper does not specifically teach adjusting a size of active data field to one of a plurality of sizes; however, Cho in an analogous art teaches an adaptive forward error correction protocol for low-earth orbit satellite networks, the protocol comprising: a channel estimation scheme wherein the packet error rate (PER) is monitored and a code selection algorithm wherein when the PER is compared to a quality of service (QoS) a code set size is adjusted based on comparison results and the adjustment may be selected from a minimum to a maximum code set (see pg. 2939 sect. B.2). Cho further teaches the length of a data field depends on the size of the code set and a packet includes multiple fields (see pg. 2940 sect. C).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify adjusting FEC parameters to include adjusting the size to one of a plurality of sizes as taught by Cho, since Cho teaches varying the size of the code set ensures reliable communication. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a method for varying the size of the code to achieve reliable communication as taught by Cho (see pg. 2941 sect. IV).

As per claim 8, Cooper teaches that the communication system [100] comprises a primary station [101] ("hub") wherein the primary station includes a Reed Solomon decoder performing FEC (see par. 0018).

As per claim **9**, Cooper teaches that the secondary station receives feedback from the primary station and performs adjustments (see par. 0019). Cho also teaches adjustment is performed on the transmitted end of a communication system (see pg. 2939 sect. B. 2).

As per claims **10** to **12**, Cooper teaches that the adaptive forward error correcting method utilizes a target BER, a maximum overhead and a maximum latency ("upper threshold of quality" and "lower threshold of quality") for adjusting the FEC parameters wherein a code word length ("active data field") and check bytes length ("blank data field") are evaluated (see par. 0038 to 0039). Cooper also teaches that adjusting the FEC power involves either increasing the code word length and decreasing the check bytes length or increasing the check bytes length and decreasing the code word length (see par. 0030). Cooper further teaches adjusting the correcting power according to the comparison results for each parameter (see par. 0048 et seq.).

4.   Claim **37** is rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper et al. in view of Agarwal et al. (USP 6477669 B1).

Claim **37**:

Cooper teaches adaptive forward error correction method for a communication system [100] wherein the communication system includes a primary station [101] ("hub") with forward error correction encoders and forward error correction decoders (see par. 0018) and secondary stations [110, 112, 114] (" subscriber station") that communicates forward error correction with the primary station (see par. 0019). Cooler also teaches

that the target BER is computed based on the measured uncorrected errors counted in a sample interval (see par. 0014) and the primary station includes a decoder processing FEC according to the set parameters (see par. 0012).

Cooper further teaches that if the computed BER is greater or less than the target BER an adjustment is made to the forward error correcting power (see par. 0047 et seq.), and adjusting the FEC power involves either increasing the code word length (active data field") and decreasing the check bytes length ("blank data field") or increasing the check bytes length and decreasing the code word length (see par. 0030). Cooper does not specifically teach a predetermined upper and lower threshold of quality; however, Agarwal in an analogous art teaches a method for adative control of forward error correction wherein a BER is varied between a minimum BER and a Maximum BER and the FEC is adjusted based on the varied BER (see col. 9, lines 6 et seq.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify computing the BER of Cooper to include computing variable BER as taught by Agarwal since Agarwal teaches improved throughput is achieved by adaptive FEC parameters. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a method for achieving efficient coding gains by utilizing a variable BER to adjust the code length as taught by Agarwal (see col. 4, lines 4 to 35).

Allowable Subject Matter

5.   Claims 2 to 7, 13 to 20 and 38 to 50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6.   Claims 21 to 36 are allowed.

7.   The following is a statement of reasons for the indication of allowable subject matter:

The instant invention teaches a method for adaptive forward error correction wherein a current count step is evaluated in light of a previous count step, to obtain the difference and the step of computing a type of quality measure includes the current count step, the previous count step and the difference obtained. The prior art made of record teaches a method and an apparatus for adaptive forward error correction wherein the BER is computed based on measured uncorrected errors; however, the prior art made of record taken alone or in combination fails to teach or fairly suggest the novel features of evaluating a pervious count to obtain a difference as recited in independent claim 21.

Specifically, the prior art made of record fails to teach or fairly suggest or render obvious "an adaptive forward error correction method comprising the step of: evaluating the results of said counting step in light of pervious counts of received data codewords and packets with errors uncorrectable by forward error correction to obtain a difference;
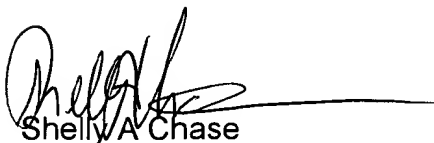
calculating a type of quality measure using at lest one of said results of said counting

step, said pervious counts and said difference."   Claims 22 to 36 are directly or

indirectly dependent on claim 21 thus; these claims are allowable over the prior art

made of record.

Conclusion

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Shelly A Chase whose telephone number is 703-308-

7246. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on 703-305-9595. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Shelly A Chase